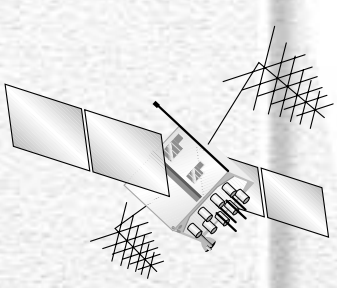
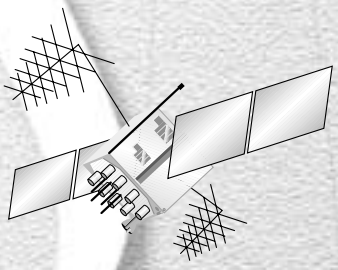
Naval Surface Fire Support

NAVAL SEA SYSTEMS COMMAND

NAVSEA
DAHLGREN
Surface Warfare Center Division





NAVAL SURFACE WARFARE CENTER

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Naval Surface Fire Support Then and Now

Before the recent retirement of our battleships, with their awesome 16-inch/50 guns, the Navy could project surface fires up to 22 nmi in support of land warfare. Accuracy and lethal radius combined to yield an effective fire support capability, albeit somewhat range-limited. Today's Navy is left with 5-inch/54 guns that have a maximum range of only 13 nmi and very limited effectiveness.

To rectify this inadequacy, Congress has directed the Navy to develop and deploy appropriate fire support technology. The result has been the establishment of the Naval Surface Fire Support (NSFS) program under the direction of the Naval Sea Systems Command, Code PMS-529, with the Naval Surface Warfare Center, Dahlgren Division (NSWCDD), serving as the Technical Direction Agent (TDA). The NSFS program's objective is to develop long-range guns and missiles designed for maximum reach and effectiveness that can be produced at the lowest possible cost.

Mission

NSWCDD's mission as the NSFS program TDA embraces the full spectrum of science and engineering relevant to the development of state-of-the-art surface weapon technology. Even though "technical direction" has given way to integrated product teams (IPTs), NSWCDD professionals are providing their expertise and experience to the IPTs responsible for the following:

- Program leadership
- Systems engineering
- Test and evaluation
- Fire control
- Global Positioning System (GPS) guidance and navigation
- Inertial navigation
- Long-range projectile airframe design
- High-energy gun mechanics
- Submunition lethality
- Rocket motor efficiency
- Insensitive munitions

These contributions will result in the design, production, and fielding of a responsive, lethal, flexible, affordable NSFS system to support the land warriors of the 21st century.

Primary Operational Requirements

- *MK 45 5-inch/62 Naval Gun:*
  Range: 21 nmi with conventional ammunition
  63 nmi with EX171 Extended Range Guided Munition (ERGM)
  Maximum muzzle energy: 18 MJ
  Maximum projectile weight: 110 lb

- *EX171 ERGM:*
  Range: 63 nmi (when launched with 18 MJ of muzzle energy)
  Accuracy: 20 m circular error probable (CEP)
  Operational environment: All weather, day or night
  Payload: 72 EX-1 dual-purpose submunitions (derived from Army's M-80)

- *Land Attack Standard Missile:*
  Range: 150 nmi
  Accuracy: 20 m CEP
  Payload: Unitary, blast fragmentation; weight: approximately 150 lb

- *Naval Fires Control System*
  Inputs: Targeting data from a variety of external sources, including the Advanced Field Artillery Tactical Data System (AFATDS)
  Outputs: Mission planning and targeting data for NSFS weapons

The Acquisition Challenge

MK 45 Gun Modification - The existing gun can deliver only 9.6 MJ when firing a round weighing 103 lb. Design changes to the barrel, breech, recoil/counter-recoil system, and carriage will yield the primary operational requirements. A new electronic interface will provide the required initialization and identification for the ERGM. At-sea tests (development testing/operational testing [DT/OT]) are to be conducted in FY04.

EX171 ERGM - A development contract has been competitively awarded. In addition to engineering assistance, NSWCDD provides test and evaluation support with range services, including a unique gun-launchable recovery system for component qualification. ERGM will enter into land-based flight tests at Yuma Proving Ground and White Sands Missile Range during FY02 and FY03. Operational testing at sea will occur in FY04.

MK 160 Gun Computer System Upgrade - This existing gunfire control system installed in the AEGIS ARLEIGH BURKE class will be upgraded to modernize its architecture, hardware components, and operational software. The new computational algorithms needed to deal with the complex flight paths of the ERGM will be added as well.

AEGIS Integration - AEGIS ships already under contract will be modified to accept the new NSFS weapon system. Applicable technical data packages are provided to the AEGIS shipbuilders in a timely manner to avoid costly delays in ship delivery. NSFS system complexity affects many aspects of ship design and construction.

The Bottom Line - Initial Operational Capability (IOC)

The entire NSFS Gun Weapon Segment is committed to an IOC within the year 2005. With such a complex system, meeting this commitment can only be accomplished with an IPT approach to program management and execution.

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NSWCDD/MP-97/125: 3/01

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NSWCDD College Recruiting Program
Human Resources Department, Code PD
17320 Dahlgren Road
Dahlgren, VA 22448-5100

Telephone: 1-800-352-7967
E-mail: recruit@nswc.navy.mil
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